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- VOLUME E -

IN THE UNITED STATES DISTRICT COURT  
IN AND FOR THE DISTRICT OF DELAWARE

ARTHROCORE CORPORATION, : CIVIL ACTION  
Plaintiff :  
vs. :  
SMITH & NEPHEW, INC., :  
Defendant : NO. 01-504 (SLR)

Wilmington, Delaware  
Tuesday, May 6, 2003  
9:30 o'clock, a.m.

BEFORE: HONORABLE SUE L. ROBINSON, Chief Judge, and a jury

APPEARANCES:

MORRIS, NICHOLS, ARSHT & TUNWELL  
BY: JACK B. BLUMENFELD, ESQ. and  
KAREN JACOBS LOUDEN, ESQ.

-and-

Official Court Reporters

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APPEARANCES (Continued):

WEIL, GOTSHAL & MANGES  
BY: JARED BOBBROW, ESQ.,  
TIMOTHY DeMAST, ESQ. and  
PERRY R. CLARK, ESQ.  
(Redwood Shores, California)

Counsel for Plaintiff

FISH & RICHARDSON P.C.  
BY: WILLIAM J. MARSDEN, JR., ESQ.,  
KEITH A. WALTER, ESQ. and  
EUGENE B. JOSWICK, ESQ.

-and-

FISH & RICHARDSON  
BY: MARK J. HEBERT, ESQ.,  
(Boston, Massachusetts)

-and-

FISH & RICHARDSON  
BY: KURTIS D. MacFERRIN, ESQ. and  
KAREN I. BOYD, ESQ.  
(Redwood City, California)

Counsel for Defendant

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PROCEEDINGS

(Proceedings commenced in the courtroom,  
beginning at 9:30 a.m., and the following occurred without  
the presence of the jury.)

THE COURT: Are there any issues before we bring  
our jury in.

MR. MacFERRIN: Opposing counsel has some  
objections to some of the exhibits we intend to use with  
the witness and also to some deposition testimony we  
intend to read to the jury.

MS. LOUDEN: I believe as to the evidence that  
Smith & Nephew said it will introduce this morning, there  
are two outstanding issues.

One is the use of certain demonstrative  
exhibits, which we have objected to.

There is a couple of slides, but they fall in  
the same category.

The first relates to Claim 1 of '882, which  
your Honor will recall is subject to the certificate of  
correction. Smith & Nephew's experts have offered no  
opinion about whether the claim is invalid or not. Yet  
they purport to have some slides which show the claim as

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if it is not the corrected claim with its crossouts and  
changes.

So we object to it both in terms of it being  
outside of the expert report as well as being argumentative  
and portraying the claim of something other than what it is  
right now.

The second kind of objection which applies to  
two or three of Smith & Nephew's exhibits, which I  
understand they intend to use with fact witnesses -- perhaps  
they could clarify but, in any event, they have a number  
of slides -- we have no objection to the picture. For  
example, this is a picture here of the Smith & Nephew  
system. But they have argumentative headings, like the  
fluid supply is not part of the ElectroBlade system.

Lawyer argument, of course, is not evidence.  
We don't think they should be able to put up a demonstrative  
that makes their arguments while they are examining  
witnesses.

We can just deal with the demonstratives or I  
can move to the deposition designations as well.

THE COURT: No. Let's get done with the  
demonstratives first.

The ones on the asserted claims of the '882  
patent, I am not so troubled by the exhibit itself as the  
fact that it's outside the scope of the expert's report.

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1  
2 Q. Okay. I'd like to finally go back to the SWOT  
3 analysis and just be sure that we understand and you make  
4 clear to us whose perspective the SWOT analysis is done  
5 from.  
6 MR. MR. HEBERT: So if we could get PX-343,  
7 please... And it would be Page 48 within the document.  
8 BY MR. HEBERT:  
9 Q. You were shown this page in cross-examination, Mr.  
10 Sparks. The SWOT analysis begins at the bottom of the  
11 page and it's for ArthroCare; right?  
12 A. Yes, that is correct.  
13 Q. Okay. From whose perspective is a SWOT analysis  
14 supposed to be written from?  
15 A. Again, as I said earlier, you put yourself into the  
16 shoes, if you will, of the other company and think about  
17 their business as they would, so that you're looking at  
18 it from the inside out and making determinations about  
19 what strength, weaknesses, opportunities and threats exist.  
20 Q. Would it be fair to say that in doing a SWOT analysis,  
21 you are pretending to be the other company and thinking  
22 about how they would view the world?  
23 MR. BLUMENFELD: Objection, leading.  
24 THE COURT: Overruled.  
25 THE WITNESS: Yes. The answer to the question

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1 is you are putting yourselves in their shoes, as I said, so  
2 you are pretending you are ArthroCare or Johnson & Johnson  
3 or Olympus or Mitek or whomever.  
4 BY MR. HEBERT:  
5 Q. And what is the purpose of doing that, of pretending  
6 you are the other company?  
7 A. It eliminates -- it makes it more objective and less  
8 subjective. So if you do it and you use your own biases  
9 and opinions, then you will miss what is a strength or a  
10 weakness or opportunity or threat so you avoid doing that.  
11 And that's the reason why you pretend to be the other  
12 company, so that you make sure you touch everything that  
13 needs to be looked at, ultimately to figure out what their  
14 strategy might be. You're guessing at their strategy.  
15 Q. Why would you want to try to figure out what the  
16 strategy of a competitor might be?  
17 A. It's all about anticipation. Our goal as an  
18 organization is to always be the most technologically  
19 advanced in every area we operate in so you are using that  
20 as an opportunity to anticipate how they may act and,  
21 therefore, make sure that your own strategy is not one  
22 that is going to lead you down the wrong path.  
23 MR. HEBERT: Nothing further.  
24 THE COURT: All right. You may step down.  
25 Thank you very much.

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1 THE WITNESS: Thank you, your Honor.  
2 Thank you, folks.  
3 (Witness excused)  
4 ---  
5 MR. MacFERRIN: Good afternoon. My name is  
6 Kurtis MacFerrin. I'm one of the attorneys representing  
7 Smith & Nephew. And I will be calling Dr. Kim Manwaring  
8 as Smith & Nephew's next witness. Dr. Manwaring will  
9 testify about his opinion that certain claims in the '882  
10 patent are invalid.  
11 Your Honor, for its next witness, Smith & Nephew  
12 calls Dr. Manwaring.  
13 THE COURT: All right. I think we'll have to  
14 speak into the microphone a little bit more.  
15 MR. MacFERRIN: All right. I will, your Honor.  
16 THE COURT: Thank you.  
17 MR. HEBERT: Your Honor, if I might tidy up...  
18 Julie, if you can assist...  
19 A VOICE: Yes.  
20 MR. HEBERT: I'll help.  
21 ---  
22 ... DR. KIM MANWARING, having  
23 been duly sworn as a witness, was  
24 examined and testified as follows ....  
25

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1  
2 DIRECT EXAMINATION  
3 BY MR. MacFERRIN:  
4 Q. Good afternoon, Dr. Manwaring.  
5 A. Good afternoon.  
6 Q. Would you please introduce yourself to the jury?  
7 A. Yes. I'm Kim Manwaring.  
8 Q. Where do you live, Mr. Manwaring?  
9 A. Phoenix, Arizona.  
10 Q. Are you married?  
11 A. Yes.  
12 Q. Do you have any children?  
13 A. Yes.  
14 Q. How many?  
15 A. Three.  
16 Q. How long have you been married?  
17 A. 26 years.  
18 Q. You're a medical doctor?  
19 A. Yes.  
20 Q. How long have you practiced medicine?  
21 A. Since 1982.  
22 Q. And where is your practice?  
23 A. In Phoenix.  
24 Q. And where specifically do you practice?  
25 A. Phoenix Children's Hospital.

1 Q. And what is your practice?  
 2 A. I specialize in the subspecialty of neurosurgery  
 3 called pediatric neurosurgery.  
 4 Q. Does that work include clinical and research?  
 5 A. In my position, that is correct.  
 6 Q. What kind of research do you do?  
 7 A. A variety of dissection and monitoring technologies  
 8 that may eventually impact diseases affecting children.  
 9 Q. Does that work include developing devices for use in  
 10 surgeries?  
 11 A. Yes.  
 12 Q. What kind of devices are those?  
 13 A. Techniques, actual instruments or tools used in the  
 14 operating rooms of neurosurgeons to facilitate the outcome.  
 15 Q. How often are you in the operating room?  
 16 A. I do about 300 surgical procedures a year.  
 17 Typically, five or six cases a week would be common.  
 18 Q. What kind of procedures do you perform?  
 19 A. A variety of problems for children, include the  
 20 management of head trauma such as the swelling or  
 21 hemorrhage in the brain when a child suffers an accident  
 22 like falling off a bicycle or hit by a car. Tumour  
 23 surgery, a form of cancer within the brain or spinal cord.  
 24 Malformations of the spinal cord or nervous system such  
 25 as spina bifida, reconstruction surgeries of the head and

1 face when it's malformed.  
 2 Q. Do you use -- what kind of devices do you use to  
 3 perform those procedures?  
 4 A. The instruments commonly consist of dissectors or  
 5 knives, forms of tweezers or forceps. Neurosurgery  
 6 contains a number of very specialized instruments because  
 7 of the constraints or limitations of working on the brain.  
 8 Q. Do you use any electrosurgical devices in your  
 9 practice?  
 10 A. Yes.  
 11 Q. And what kind of devices are those?  
 12 A. Monopolar and bipolar electrode surgery is common or  
 13 main stage neurosurgery.  
 14 Q. Do you use any devices that you developed?  
 15 A. Yes.  
 16 Q. What device is that?  
 17 A. A common device I use is called the Cogman ME2,  
 18 which is a contraption used as an micro endoscopic  
 19 dissector.  
 20 Q. When you say that, in other words, what is a  
 21 microscopic dissector?  
 22 A. When we enter into the brain through a small  
 23 incision, we can actually pass an endoscope deep into a  
 24 target with minimal injury to the brain. When we're  
 25 visualizing that target within the brain, we use

1 instruments that allow the dissection or focusing or  
 2 coagulation or actual removal of tissue through that spot  
 3 and hence the term micro, because it's through an  
 4 endoscope where they're magnifying and it's very tiny to  
 5 operate, typically on the range of, oh, a 16th of an inch,  
 6 an 8th of an inch area.  
 7 Q. That is because you are operating on children?  
 8 A. No, these principles also apply to adult  
 9 neurosurgery. And I do do adult neurosurgery occasionally  
 10 when it applies to my specialty.  
 11 Q. Do you have any patents or publications in the field  
 12 of electrosurgery?  
 13 A. Yes.  
 14 Q. Roughly, how many?  
 15 A. I have two patents in electrosurgery.  
 16 Q. And roughly how many publications do you have?  
 17 A. Several. I'd have to look at my curriculum vitae or  
 18 CV to count them.  
 19 Q. What is a curriculum vitae?  
 20 A. It's a summary or listing of my publications,  
 21 presentations, patents, funding I've received to do  
 22 research.  
 23 Q. Could you turn please to Tab DTX-427 in your binder?  
 24 A. Yes.  
 25 Q. Can you identify that for us?

1 A. Yes. This is my curriculum vitae.  
 2 Q. Is that like a resume?  
 3 A. Yes.  
 4 Q. Is this an accurate description of your curriculum  
 5 vitae as of the time it was updated in October of 2002?  
 6 A. Yes.  
 7 MR. MacFERRIN: Your Honor, I ask this exhibit,  
 8 DTX-427, be admitted into evidence.  
 9 MR. BOBROW: No objection.  
 10 THE COURT: Thank you.  
 11 THE DEPUTY CLERK: So marked.  
 12 \*\*\* (Defendant's Exhibit No. 427 was received into  
 13 evidence.)  
 14 BY MR. MacFERRIN:  
 15 Q. Have you received any awards for your work?  
 16 A. Yes.  
 17 Q. More than one?  
 18 A. I'm sorry?  
 19 Q. Have you received more than one?  
 20 A. Yes.  
 21 Q. Now, I'd like to ask specifically about this case.  
 22 How did you first become involved in this case?  
 23 A. About one year ago, you, Mr. MacFerrin contacted me  
 24 asking me if I would be willing to review the patent in  
 25 question as it related to certain claims.

1 Q. Are you being compensated for your time working on  
2 this case?  
3 A. Yes.  
4 Q. What were you asked to do?  
5 A. I was asked to read through and compare also to my  
6 patent, and render a judgment whether I felt those claims  
7 were valid.  
8 Q. Could you turn please to JTX-2, the binder in front  
9 of you?  
10 A. (Witness complied.)  
11 Q. What is this?  
12 A. Yes. This is the patent you asked me to review. It  
13 is authored by Mr. Eggers and it is referred to subsequently  
14 as the '882 patent.  
15 Q. What work did you do for your review of this patent?  
16 A. I read through this patent as well as some additional  
17 materials, including my patent, and reviewed in discussion  
18 with you principally by telephone at a distance my  
19 reactions to it.  
20 Q. Other than your patent, were there any other  
21 materials that you reviewed?  
22 A. Yes. I was subsequently given additional materials  
23 that included the opinion of Dr. Goldberg.  
24 Q. Did you form an opinion on whether or not the '882  
25 patent claims are valid?

1 A. Yes.  
2 Q. What is your opinion?  
3 A. I feel that the claims and limitations are, in large  
4 part, not valid. When I say in large part, some of them I  
5 feel are unique and valid.  
6 Q. How about Claims 13 -- if I could direct your  
7 attention to Claims 13 and 54 of the '882 patent...  
8 Did you reach an opinion on the validity of  
9 those patents?  
10 A. Yes.  
11 Q. What is your opinion?  
12 A. They are not valid.  
13 Q. I'd now like to ask you about your patent. If you  
14 could turn please to DTX-46 in your binder...  
15 MR. MacFERRIN: Gary, could you pull this up,  
16 please?  
17 BY MR. MacFERRIN:  
18 Q. Is this the '138 patent from which your opinion is  
19 based?  
20 A. Yes.  
21 Q. Is that your name there?  
22 A. Yes.  
23 Q. Now, what does this patent show?  
24 A. This is the description of a device which I  
25 developed and routinely use in the operating room. It

1 is called a tissue vaporizing accessory and method for  
2 an endoscope.  
3 Q. Are you familiar with the term monopolar?  
4 A. Yes.  
5 Q. Did you read Mr. Eggers' testimony about the '882  
6 patent?  
7 A. Yes.  
8 Q. Did you read the part where he discusses Claim 1 of  
9 his patent includes monopolar?  
10 A. That can employ and work with a monopolar approach,  
11 that's correct.  
12 Q. What kind of device is your device?  
13 A. My device is monopolar.  
14 MR. MacFERRIN: Your Honor, I move that DTX-46  
15 be admitted into evidence.  
16 THE COURT: And actually it shouldn't have been  
17 on the screen until it was admitted into evidence.  
18 Is there any objection?  
19 MR. BOBROW: No objection.  
20 THE COURT: All right. Thank you.  
21 MR. MacFERRIN: I apologize.  
22 THE COURT: That's all right.  
23 BY MR. MacFERRIN:  
24 Q. Did the device described by this patent ever become a  
25 product?

1 A. My patent?  
2 Q. Yes.  
3 A. Yes, that is a product.  
4 Q. And what is the name of that product?  
5 A. Yes, this is the Cogman ME2 I was referring to  
6 earlier in one of your previous questions.  
7 Q. Do you make or sell that product?  
8 A. No.  
9 Q. Does someone else make or sell that product?  
10 A. Yes.  
11 Q. Who is that?  
12 A. It's marketed by the Division of Neurosurgery  
13 within Johnson & Johnson which is called Cogman.  
14 Q. I'd now like to turn to the basis for your opinions.  
15 A. Okay.  
16 Q. What is the basis for your opinion that Claims 13  
17 and 54 of the '882 patent are invalid in view of your  
18 patent?  
19 A. I feel my patent describes each of the those  
20 entities when read carefully matched component to  
21 component.  
22 Q. I'd now like to ask you how did you that analysis.  
23 MR. MacFERRIN: Gary, could you please put up  
24 DTX-201?  
25

1  
2 BY MR. MacFERRIN:  
3 Q. If I could correct your attention to this slide.  
4 Could you tell us what this is showing us?  
5 A. The pictogram on the right is derived directly from  
6 my patent on the front page and shows the tip of my  
7 vaporizing accessory.  
8 On the left, in the left column under Claim 1  
9 of '882 is the word description or first claim of Mr.  
10 Eggers' patent.  
11 Q. Would it help you to have a laser pointer to use?  
12 A. I suppose.  
13 MR. MacFERRIN: Your Honor, may I approach?  
14 THE COURT: Yes, you may.  
15 BY MR. MacFERRIN:  
16 Q. Before I ask you about this, I just want to make sure  
17 that I was clear about one thing about Mr. Eggers'  
18 testimony you read. His testimony about monopolar, that  
19 did not concern your patent, did it?  
20 A. Not that I understand, no.  
21 Q. Did that concern his patent, the '882 patent?  
22 A. Yes.  
23 Q. Does your patent disclose the first part of Claim 1  
24 shown here, method for applying energy to a target site  
25 on a patient body structure?

1 A. Yes. In fact, I feel Claim 1 is a very good  
2 description of my patent.  
3 Q. Have you read Dr. Goldberg's rebuttal report?  
4 A. Yes.  
5 Q. Did you read that after you had submitted your report?  
6 A. No, I read it first. I'm talking about that which  
7 was supplied to me about two months ago. I read his  
8 report at that point but the rebuttal I've been aware of  
9 subsequently; only recently read that, perhaps three days  
10 ago.  
11 Q. But you have read that?  
12 A. Yes.  
13 Q. And in his report, in that rebuttal report, does he  
14 disagree with you that is patent discloses limitations?  
15 A. Yes. Oh, I'm sorry. I misunderstood you. His  
16 disagrees about limitations and my interpretation, but he  
17 does not disagree with this Claim 1 that also describes  
18 my patent.  
19 Did I understand you correctly?  
20 Q. I think you did.  
21 A. Okay. Could you talk just a little louder?  
22 Q. Okay. Sorry.  
23 A. Thank you.  
24 Q. I'm getting over a cold.  
25 MR. MacFERRIN: Could I have the next graphic,

1 please?  
2 This is DDTX -- actually DDTX-202. Could I have  
3 DDTX-202 please?  
4 Okay.  
5 BY MR. MacFERRIN:  
6 Q. Well, let me ask you, about -- sorry.  
7 (Pause.)  
8 BY MR. MacFERRIN:  
9 Q. Here we go. It looks like it's a little out of  
10 order. I apologize. This is DDTX-204. And I'd like to  
11 ask you about -- do you see that? What is this graphic  
12 showing us?  
13 A. Well, again, this is my same picture on the front of  
14 my patent, but the tip of it, the tip of the electrode  
15 within the tip of the catheter itself or the device that  
16 is passed through an endoscope is highlighted in red, and  
17 on the left is a column extracting or highlighting  
18 certain words of Mr. Eggers' patent providing an  
19 electrode terminal, and here in my description of my  
20 patent is essentially the identical description.  
21 Q. Can you point out, is there an electrode terminal?  
22 A. Yes. I'm sorry. The first end of the electrical  
23 conductor extends coaxially through the tube.  
24 This is the equivalent of the electrode  
25 terminal.

1 MR. MacFERRIN: May I have DDTX-202?  
2 BY MR. MacFERRIN:  
3 Q. And what is this graphic showing us?  
4 A. Again, the same picture, and again, wording from  
5 Claim 1 from Mr. Eggers' and wording from my patent.  
6 Here, we're describing the necessity to have this device  
7 function correctly is that of a return electrode which is  
8 electrically coupled to a high-frequency voltage source.  
9 In my description, in accordance with standard  
10 practice, the RF generator, radio frequency generator, is  
11 grounded to the patient on whom surgery is to be performed.  
12 Q. And in his report, does Dr. Goldberg disagree with  
13 your conclusion that your patent discloses this feature?  
14 A. No.  
15 Q. Did he disagree with the previously-featured  
16 electrode terminal that which was disclosed in your  
17 patent?  
18 A. No.  
19 MR. MacFERRIN: Can I have the next graphic,  
20 please?  
21 BY MR. MacFERRIN:  
22 Q. Would you please explain to us what this graphic is  
23 showing?  
24 A. In the '882 patent of Mr. Eggers, highlighted terms  
25 are, relate more to the method or technique of use now

1 that the electrode terminal is positioned in close  
2 proximity to the target site in the presence of an  
3 electrically conducting fluid.

4 Then derived from my patent, as illustrated  
5 in Figures 2 and 4, a source of pressurized fluid such as  
6 electrically conductive saline can be injected into the  
7 second input of the Tuohy-Borst adaptors. This is how  
8 my device is hooked up. These are merely connectors.  
9 Q. In his report, does Dr. Goldberg disagree that your  
10 patent discloses this feature?

11 A. No.

12 MR. MacFERRIN: For the record, this is  
13 DDTX-204.

14 Could I next have -- actually, yes, can I next  
15 have DDTX-205? DDTX-206.

16 (Pause.)

17 ---

18

19

20

21

22

23

24

25

1

2 BY MR. MacFERRIN:

3 Q. Dr. Manwaring, what is this graphic?

4 A. This is, again, that same format. In Mr. Gregor's  
5 patent he explains it is necessary to apply a high-  
6 frequency voltage between the electrode terminal and the  
7 return electrode. The high-frequency voltage being  
8 sufficient to vaporize the fluid in a thin layer over at  
9 least a portion of the electrode terminal.

10 In my device, I describe the exact same  
11 concept. The adjacent tissue is rapidly dessicated and  
12 then vaporized. Such RF sparking followed by fluid  
13 vaporization is generally referred to as fulguration and  
14 is a well-known phenomenon.

15 I should explain, in my picture, fluid-filled  
16 medium, the tip of this electrode is placed in salt-laden  
17 fluid. In the instance of the brain, that as  
18 cerebrospinal fluid. In the instance of other targets, it  
19 is very similar fluid, call physiologic saline, and acts  
20 the same from an RF or electrosurgery point.

21 Q. That spark that you described, what does that  
22 reflect?

23 A. Off of the tip of the electrode emits a spark. Since  
24 there is salt fluid in the tip of that environment, as RF  
25 or electricity is passed down through that tip, the salt

1 fluid is conductive of electricity.

2 So as current heat passes through it, it heats  
3 the fluid in the tiny recessed tip area. That creates a  
4 steam barrier. And now the electricity passes across by  
5 sparking or arcing, which is an essential component for  
6 my device to work.

7 Q. You mentioned steam. Does that have an appearance?  
8 Do you see bubbles?

9 A. Yes. In operation, one does visualize bubbles.

10 Q. And the spark or arc that you described, does that  
11 have -- can you describe that appearance for us?

12 A. Yes. It has a kind of yellow-orange glow.

13 MR. MacFERRIN: If I can have DDTX-206...

14 BY MR. MacFERRIN:

15 Q. Dr. Manwaring, could you describe what we are seeing  
16 here?

17 A. Yes. In Claim 13 now of Mr. Eggers' patent, the  
18 method of Claim 1 wherein at least a portion of the energy  
19 induced is in the form of photons having a wavelength in  
20 the ultraviolet spectrum.

21 Then in my patent, such RF sparking is  
22 generally referred to as fulguration and is a well-known  
23 phenomenon.

24 Q. Does that sparking result in ultraviolet light?

25 A. I am sure it does.

1 Q. Why are you sure that it does?

2 MR. BOBROW: Object, your Honor. That is  
3 beyond the scope of his report.

4 THE COURT: Overruled. The specific matter  
5 that we discussed cannot be admitted. If there is another  
6 basis for that opinion, that doesn't involve the matter we  
7 discussed, then I will allow the question.

8 MR. MacFERRIN: Thank you, your Honor.

9 THE WITNESS: I can answer?

10 BY MR. MacFERRIN:

11 Q. Yes.

12 A. When an electrode is put into salt water, whether  
13 it is a monopolar pencil blade or my electrode or Mr.  
14 Eggers' electrode, if it is in salt water and electricity  
15 is passing through it with sufficient intensity to create  
16 sparking, that sparking emits light. And some of that  
17 light is perceivable by the eye, which is the orange/  
18 yellow glow I described, but some of it is not perceivable  
19 by the eye, which is outside of that range.

20 Q. Can you think of any other examples of something you  
21 can't see, but you know it's there?

22 A. Sure. In the instance of light, since we are  
23 talking about light, most of us are familiar with the  
24 famous scientist Isaac Newton. Isaac Newton held up a  
25 prism in the sunlight and, as the sunlight passed through

1 the prism, he saw on the back wall a whole display of  
 2 colors, which we now refer to as a rainbow, because the  
 3 exact same thing happens in the sky as sunlight passes  
 4 through moisture.  
 5 And that rainbow includes colors that we are  
 6 all familiar with, tapering out at both ends to no other  
 7 colors.  
 8 But Isaac Newton found that there were other  
 9 colors in that light spectrum that couldn't be seen with  
 10 the eye. In fact, he is the one who gave us the term  
 11 infrared, which means below red, because he discerned that  
 12 there was heat being emitted in the prism beyond where  
 13 there was no light.  
 14 So infrared is an example of light you can't  
 15 see but you can feel. The other end of the spectrum is  
 16 ultraviolet, which is also there, but we can't see it with  
 17 our eyes. We know it's there.  
 18 MR. MACFERRIN: May I have the next one,  
 19 please?  
 20 BY MR. MACFERRIN:  
 21 Q. DDTX-207. Dr. Manwaring, could you describe for us  
 22 what this graphic is showing?  
 23 A. Yes. Again, in Mr. Gregor's patent is a Claim No. 54,  
 24 which also derives from Claim 1. It describes a method  
 25 with a device further comprising evacuating fluid generated

1 at the target site with a suction lumen having a distal end  
 2 adjacent to the electrode terminal.  
 3 And in my patent, the similar wording, again.  
 4 Again, this tip is in that fluid environment. In such  
 5 an alternative embodiment of the invention, a neutral or  
 6 negative pressure could be provided within the fluid  
 7 interior of Tube 28 such that the fluid from the fluid-  
 8 filled medium of the working environment could be sucked  
 9 or drawn up to a sufficient elevation.  
 10 Q. So does your patent disclose this additional feature  
 11 of Claim 54?  
 12 A. Yes.  
 13 Q. If I could ask you now to turn to DTX-46 in your  
 14 binder...  
 15 Dr. Manwaring, do you understand your patent --  
 16 what date did your patent issue?  
 17 A. June 16, 1992, my patent was issued.  
 18 Q. And looking at Item 22 on the left, do you see that  
 19 there, Dr. Manwaring?  
 20 A. Yes.  
 21 Q. What date was the application for your patent filed?  
 22 A. November 28, 1990.  
 23 MR. MACFERRIN: Thank you.  
 24 THE COURT: Cross-examination.  
 25

1  
 2 CROSS-EXAMINATION  
 3 BY MR. BOBROW:  
 4 Q. Good afternoon, Dr. Manwaring.  
 5 A. Good afternoon.  
 6 Q. We met briefly in the hallway. My name is Jared  
 7 Bobrow. I am one of the attorneys representing ArthroCare  
 8 Corporation.  
 9 First of all, you still have your patent, the  
 10 '138 patent; is that right?  
 11 A. Yes.  
 12 Q. And if I understood what you just testified to about  
 13 ultraviolet photons, it's your testimony that where you  
 14 refer in this patent to sparking, that that is a  
 15 disclosure of the emission of ultraviolet photons; is that  
 16 right?  
 17 A. The emission of all light that arises from that  
 18 process.  
 19 Q. Does that include ultraviolet photons?  
 20 A. Sure.  
 21 Q. Now, your patent never refers to ultraviolet photons,  
 22 does it?  
 23 A. No.  
 24 Q. There is no mention in it, in fact, of ultraviolet  
 25 light; is that correct?

1 A. That's correct.  
 2 Q. And at the time that you prepared your report in  
 3 this matter back in February of this year, you hadn't  
 4 done any tests to determine whether the device that is  
 5 described in your '138 patent emits photons of  
 6 ultraviolet light. Is that true?  
 7 A. That's correct.  
 8 Q. Now, its also true, is it not, that back at the time  
 9 of your report, back in February, you were not aware of  
 10 anybody else doing any testing on your device that is  
 11 described here in the '138 patent to show that it emits  
 12 ultraviolet photons; correct?  
 13 A. At that time, that's correct.  
 14 Q. You are not a physicist. Is that true?  
 15 A. No, I am not a physicist.  
 16 Q. You do not have a degree in physics; is that right?  
 17 A. That's correct.  
 18 Q. You do not have a degree in electrical engineering.  
 19 Is that true?  
 20 A. That's correct.  
 21 Q. Now, with respect to your testimony, you mentioned  
 22 something about Isaac Newton; right?  
 23 A. Yes.  
 24 Q. And you mentioned that he detected that there was  
 25 infrared light beyond the visible portion of the rainbow.

Page 899

1 True?  
 2 A. That's correct.  
 3 Q. It sounds like he did some sort of a test; is that  
 4 right?  
 5 A. Yes. He held a prism into the sun.  
 6 Q. And he was able to then detect heat beyond the area;  
 7 correct?  
 8 A. Yes.  
 9 Q. And so he detected this empirically; is that right?  
 10 A. That's fair to say.  
 11 Q. And at the time that you prepared your report, you  
 12 did nothing empirically to determine that UV photons are  
 13 emitted by the device that is described in your patent,  
 14 the '138 patent. Is that true?  
 15 A. Yes. At that time I had not.  
 16 Q. Now, your device that you describe in here is a  
 17 monopolar device; correct?  
 18 A. Correct.  
 19 Q. And that means that the return electrode is attached  
 20 someplace to the outside of the patient's body; correct?  
 21 A. Yes.  
 22 Q. And oftentimes that's attached to the thigh or the  
 23 back or what-have-you. True?  
 24 A. Correct.  
 25 Q. So when you mention that there was electrically

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1 conducting fluid in the brain, for example, I take it that  
 2 the return electrode in your invention is not in contact  
 3 in any way with that electrically conductive fluid. Is  
 4 that true?  
 5 A. Yes. In the sense that it's attached to the outside  
 6 of the body and one is working on the inside, I believe  
 7 that's a fair characterization.  
 8 Q. So the return electrode in your invention doesn't  
 9 contact the electrically conductive fluid; is that right?  
 10 A. That's correct.  
 11 Q. Now, you also, I believe, talked about on your  
 12 direct examination this issue of suction.  
 13 MR. BOBROW: Perhaps we can put Figure 5 of the  
 14 '138 patent up on the screen.  
 15 If you can blow that up, Chris, I would  
 16 appreciate it.  
 17 BY MR. BOBROW:  
 18 Q. Here, Dr. Manwaring, you see there it says fluid-filled  
 19 medium; is that right?  
 20 A. Yes.  
 21 Q. And what we are looking at there is the tip of this  
 22 device. Is that true?  
 23 A. That's correct.  
 24 Q. And the fluid-filled medium in the case of surgery  
 25 on the brain is that cerebrospinal fluid; right?

Page 901

1 A. No, not necessarily. Just like arthroscopic  
 2 surgery, we must maintain a certain amount of brain  
 3 enlargement because we have entered in with a trochar.  
 4 And, therefore, we inject fluid, which is compatible or  
 5 like cerebrospinal fluid, which happens to be physiologic  
 6 saline or something very similar to it.  
 7 Q. But in your -- let me ask a different question.  
 8 The brain is surrounded by cerebrospinal fluid; is that  
 9 right?  
 10 A. Yes.  
 11 Q. In fact, the body generates its own cerebrospinal  
 12 fluid; is that right?  
 13 A. Yes.  
 14 Q. About how much a day?  
 15 A. About 700 milliliters. That would be a typical --  
 16 that is almost a quart for your reference. Most adults  
 17 would make about that much a day.  
 18 Q. And the brain is surrounded by that, such when you  
 19 go into the surgical site there is cerebrospinal fluid  
 20 that is present; correct?  
 21 A. Yes.  
 22 Q. And in your patent, there is one embodiment where  
 23 you talk about introducing some saline through that tube;  
 24 right?  
 25 A. Yes.

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1 Q. And the rate at which the saline is introduced is  
 2 at the rate of a couple of drops a second; right?  
 3 A. Yes.  
 4 Q. About three or four drops per second. True?  
 5 A. You could perhaps show me where you are referring.  
 6 Q. That is Column 7, if you would like to look. Column 7,  
 7 about Line 10.  
 8 A. But for your purposes, I have no concern about that.  
 9 Q. Now, if we could go to Column 7 of the patent, please.  
 10 The paragraph that begins at Line 11 and goes to Line 31.  
 11 MR. BOBROW: If you could please highlight  
 12 that...  
 13 BY MR. BOBROW:  
 14 Q. Dr. Manwaring, here in your patent you are describing  
 15 an embodiment in which you are not delivering fluid to the  
 16 surgical site; is that right?  
 17 A. Yes.  
 18 Q. In fact, at Lines 19 through 21, it begins by saying,  
 19 If the source of pressurized fluid as illustrated in  
 20 Figure 2 were omitted, some alternative means would have  
 21 to be provided to fill at least the interior tip of 32  
 22 with fluid to enable the invention to operate in the  
 23 fulguration mode as described above, and it goes on.  
 24 Do you see what I am referring to there?  
 25 A. Yes, I do.



1 Q. So in that column, in describing this section, there  
 2 is no electrically conductive fluid being introduced into  
 3 the surgical site; correct?  
 4 A. In that the instrument is introduced into the fluid  
 5 medium, it exists there and this is what is referenced to  
 6 before as the neutral environment, in contrast to a  
 7 sucking environment, which would be negative or a positive  
 8 environment where one was irrigating forward.  
 9 Q. Just to be clear here, what you are describing in  
 10 the paragraph that is up on the screen is an embodiment  
 11 where fluid is not being introduced into the brain cavity?  
 12 A. Yes, that's correct.  
 13 Q. Okay. Now, what you are describing here, then, is  
 14 using either neutral or some sort of negative pressure to  
 15 suck up some of the fluid that is in the brain already;  
 16 correct?  
 17 A. That's correct.  
 18 Q. That would be the cerebrospinal fluid; right?  
 19 A. No. In the practical application, we always have  
 20 mixed salt water, or physiologic saline which has been  
 21 introduced by the endoscope for the exact same reasons we  
 22 do in arthroscopic surgery, it is to clear blood, maintain  
 23 that crystal-clear environment. So in appropriate  
 24 description, it is a mix.  
 25 Q. Fair enough. And when the energy is applied using

1 your device, in this embodiment you are describing here,  
 2 the application of the energy isn't creating electrically  
 3 conductive fluid, is it?  
 4 A. No. It's not creating -- that electrically  
 5 conductive fluid is there at the tip.  
 6 Q. And the application of energy is not what is  
 7 generating either cerebrospinal fluid or saline or any  
 8 other fluid. True?  
 9 A. Correct.  
 10 Q. Now, when you put either neutral or negative  
 11 pressure at the tip, isn't it fair to say that then some  
 12 fluid gets sucked in at the tip of the device; correct?  
 13 A. In the instance --  
 14 Q. So it goes --  
 15 A. In the instance of the neutral environment, the tip  
 16 is barely recessed. It is a non-contact technique. So  
 17 when the device is put into that space, fluid wells into  
 18 it readily.  
 19 Q. Wells up into the tube of this device?  
 20 A. That's right.  
 21 Q. And then the device is then placed in the vicinity  
 22 of the target tissue that you want to treat; correct?  
 23 A. Exactly.  
 24 Q. So isn't it fair to say, then, that if fluid remains  
 25 at or on the target site, that you are trying to treat in

1 the course of a surgery?  
 2 A. That's correct.  
 3 Q. Now, let's take a look at Claim 1 of the '882 patent,  
 4 which is JTX-2.  
 5 MR. BOBROW: If you can go to the last Page of  
 6 JTX-2...  
 7 BY MR. BOBROW:  
 8 Q. Do you have that in your binder, sir?  
 9 A. I can bring it up, yes.  
 10 MR. BOBROW: If you would please, Chris,  
 11 highlight the last paragraph, that begins applying a high-  
 12 frequency voltage.  
 13 BY MR. BOBROW:  
 14 Q. Dr. Manwaring, in this paragraph, I just want to  
 15 make sure that I have down here the sequence at least as  
 16 you understand it of events that are being described here.  
 17 The first thing that happens is that a high-frequency  
 18 voltage is being applied between the active electrode and  
 19 the neutral, or return electrode. Is that true?  
 20 A. Yes. The return electrode.  
 21 Q. And by virtue of the application of that voltage,  
 22 then, the next thing that happens is that you vaporize  
 23 some fluid that is in the vicinity of the very tip of the  
 24 active electrode; right?  
 25 A. I agree.

1 Q. And then once you form that vapor area in the tip  
 2 of the electrode, then what happens is you get this energy  
 3 discharge, either, you know, plasma or arcs or what-have-  
 4 you at the tip of the device, sparks, for example?  
 5 A. You have used sparking, yes.  
 6 Q. Essentially what is described here in the '882 patent  
 7 is application of a voltage followed by a vaporization of  
 8 the electrically conductive fluid, followed by sparking;  
 9 is that right?  
 10 A. I agree.  
 11 Q. Now, your patent describes something different,  
 12 doesn't it?  
 13 A. No.  
 14 Q. Well, let's take a look and see. Let's take a look  
 15 at Column 6 of your patent. Specifically, the paragraph  
 16 beginning at Lines 50 through 63?  
 17 MR. BOBROW: If you could highlight that,  
 18 Chris, I would appreciate it.  
 19 BY MR. BOBROW:  
 20 Q. Now, this is a paragraph that you had up earlier  
 21 when you were being asked questions on direct examination;  
 22 correct? Is that right?  
 23 A. Yes, that's correct.  
 24 Q. And when you had this paragraph up, you were saying  
 25 that this language described the paragraph that we were

1 just looking at in the '882 patent; correct?  
 2 A. Yes.  
 3 Q. And here, in your patent, in the '138 patent; it  
 4 refers in this patent, beginning at about Line 54, it  
 5 says, when end phase 40 is placed either in close proximity  
 6 to or in contact with tissue, as illustrated in Figure 5,  
 7 the sparking results in the generation of extremely high  
 8 temperatures, causing vaporization of the fluid within  
 9 region 46 and virtually instantly achieves temperatures  
 10 estimated to reach approximately 400 degrees Centigrade.  
 11 Then it goes on a little further down: Such RF sparking  
 12 followed by fluid vaporization is generally referred to  
 13 as fulguration and is well known.  
 14 Your patent, sir, is describing sparking  
 15 followed by fluid vaporization; correct?  
 16 A. Yes. Similarly, I could play with the words and  
 17 say when the device was placed into the field, as he says  
 18 here, the sparking emits. But it's clearly indicated in  
 19 the context that the device was actuated. It is also  
 20 clearly indicated that you cannot get sparking in a fluid  
 21 medium, because there is nothing to spark across. So it  
 22 has to be heated.  
 23 Q. Thank you. The thing is, I don't want to play with  
 24 the words. I am asking you that the words in your patent,  
 25 which has been asserted as prior art, shows in sequence

1 sparking followed by the vaporization. Is that true?  
 2 A. Yes. And I want to be clear that the concept of  
 3 fulguration is a very well-known old phenomenon, which  
 4 means that sparking must jump from an electrode across to  
 5 another surface. And it implies that that order is well  
 6 known.  
 7 Q. Now, you had mentioned on your direct examination  
 8 that you are being compensated in connection with your  
 9 work on this matter?  
 10 A. Yes.  
 11 Q. Smith & Nephew is the one that is paying you?  
 12 A. Yes.  
 13 Q. That is at the rate of \$450 an hour; is that right?  
 14 A. Yes.  
 15 Q. Now, have you worked with a man by the name of Dr.  
 16 Taylor in this case?  
 17 A. I have not worked with him. I have met him.  
 18 Q. In connection with the preparation of your expert  
 19 report in this matter, did you consult with him?  
 20 A. No.  
 21 Q. Did you work with him?  
 22 A. No.  
 23 Q. Did you two exchange drafts?  
 24 A. No.  
 25 Q. The two of you worked independently. That true?

1 A. That's correct.  
 2 Q. I would like to show you what was marked as DTX-424.  
 3 I apologize, sir. I don't believe that's going to be in  
 4 your binder.  
 5 DTX-424 appears to be a copy of the report  
 6 that you prepared; is that right?  
 7 A. This is correct.  
 8 Q. I would like to ask you about a portion of this  
 9 report, and specifically, on the fourth page, there is a  
 10 book labeled Claim 13 of the '882 patent.  
 11 Do you see that?  
 12 A. Yes.  
 13 Q. And this was language that you prepared in connection  
 14 with this case?  
 15 A. I explained my interpretations. Mr. MacFerrin  
 16 prepared this document. I reviewed and agreed that it was  
 17 consistent with. So, yes, that's reasonable to state that.  
 18 Q. So Mr. MacFerrin, Smith & Nephew's lawyers, prepared  
 19 this document, you reviewed it and then signed it after  
 20 comment with him?  
 21 A. Yes, again emphasizing, I explained my opinion. He  
 22 put it in paper. I reviewed it and affirmed that it was  
 23 consistent with.  
 24 MR. BOBROW: I would like to put up Claim 13  
 25 of Page 4 of DTX-424.

1 MR. BOBROW: if you could highlight that,  
 2 please...  
 3 BY MR. BOBROW:  
 4 Q. And for Claim 13, this relates to the UV photon issue;  
 5 correct?  
 6 A. Yes.  
 7 Q. And you state that the '138 patent specifically  
 8 mentions sparking during operation. Then you cite to  
 9 Column 6, Lines 50 to 63; is that right?  
 10 A. Yes.  
 11 Q. Then you say, the spark results in the emission of  
 12 UV and other wavelengths of light; correct?  
 13 A. Yes.  
 14 Q. And you signed this report; right?  
 15 A. Yes.  
 16 Q. With that language?  
 17 A. Yes.  
 18 MR. BOBROW: Your Honor, may I approach?  
 19 THE COURT: Yes.  
 20 BY MR. BOBROW:  
 21 Q. I would like to show you now DTX-400. DTX-400 is  
 22 called Expert Report, Kenneth D. Taylor. Have you ever  
 23 seen DTX-400 before?  
 24 A. No.  
 25 Q. This is the first time?

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1 A. Yes.

2 Q. If you could, please, turn in that document to the

3 section on Claim 13. And specifically on Page 62.

4 MR. MACFERRIN: Your Honor, I object. This

5 exhibit has not been admitted into evidence.

6 THE COURT: I don't want the whole exhibit

7 admitted into evidence. It is impeachment. I am not

8 exactly sure where we are headed. Since it's lunchtime,

9 we will talk about it in a moment.

10 Members of the jury, I will remind you during

11 your lunch break you are not to discuss the case among

12 yourselves or with anyone else.

13 (At this point the jury then left the

14 courtroom, and the following occurred without the presence

15 of the jury.)

16 THE COURT: Sir, you may step down.

17 (Witness steps down from stand.)

18 MR. BOBROW: Your Honor, perhaps an instruction

19 should be given to the witness, in case he is unfamiliar

20 with the rules of our discussions.

21 THE COURT: All right. Hopefully the instruction

22 doesn't have to be given. I will remind counsel for the

23 defendant that he is not to discuss substantively the

24 witness' testimony, since he is on cross. But you may go

25 ahead and start your lunch break, since it will not be

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1 very quick.

2 With respect to this, of course, anything can

3 be used to impeach an expert, even a rock. Generally,

4 it's real difficult because I generally don't allow

5 documents to be shown to a jury that haven't been admitted.

6 But I certainly don't want to admit expert reports.

7 So the question is whether any of this should

8 be shown to the jury as opposed to your directing the

9 examination without the illustration. That's basically

10 the objection at this point?

11 MR. MACFERRIN: It is, your Honor.

12 MR. BOBROW: Your Honor, I think it is fair

13 for the jury to see side by side the language that these

14 two experts put together independently, they will testify

15 that it's the same language. I think I am entitled to

16 impeach on that basis.

17 THE COURT: Don't use that word.

18 MR. MACFERRIN: Your Honor, if I may respond.

19 These exhibits are never going to come into evidence.

20 They are expert reports. Earlier, a 510-K was used for

21 impeachment. And that was not permitted to be shown to

22 the jury.

23 THE COURT: That's true. So we have to play

24 by the same rules.

25 All right. Despite the fact we let you put

Page 913

1 the one up, we are not going to put either that up or

2 the other one up.

3 Thank you, counsel.

4 (Luncheon recess taken.)

5 - - -

6 AFTERNOON SESSION

7

8 (Proceedings resumed at 1:30 p.m.)

9

10 THE COURT: All right. Thank you. Anything

11 before we bring the jury in?

12 All right.

13 (At this point the jury entered the courtroom

14 and took their seats in the box.)

15 THE COURT: All right. Mr. Bobrow.

16 MR. BOBROW: Thank you, your Honor.

17 BY MR. BOBROW:

18 Q. Good afternoon, Dr. Manwaring.

19 A. Good afternoon.

20 Q. Before the break, I was asking you about Claim 13

21 of the '882 patent, your report on the subject and Dr.

22 Taylor's report on the subject.

23 Are you with me so far?

24 A. Yes.

25 Q. Now, do you still have your report in front of you?

Page 914

1 A. On Page 62?

2 Q. Your report, which is DTX-424, Page 4.

3 A. Yes, I do.

4 Q. And when you were commenting in your report on the

5 '138 patent and its relationship to Claim 13, you wrote,

6 quote, The '138 patent specifically mentions sparking

7 during operation, period. Column 6, Lines 50-63, period.

8 The spark results in the emission of UV and other

9 wavelengths of light; correct?

10 A. Yes, mm-hmm.

11 Q. Now, if you can turn, please, to DTX-400...

12 And this is Dr. Taylor's report; correct?

13 A. Yes.

14 Q. This is the report that you have never seen before;

15 right?

16 A. That's correct.

17 Q. And turn to Page 62, please.

18 A. I'm there.

19 Q. And you see in the middle of the page, there is a

20 discussion about Claim 13. Do you see that?

21 A. Yes.

22 Q. And this is about the '882 patent; right?

23 A. That, I don't know, but it surely looks familiar.

24 Q. Yes. And you will see that in Dr. Taylor's report

25 it is written, quote, Manwaring '138 specifically mentions

1 sparking during operation, period. Column 6, Lines 50-63  
 2 period. The spark results in the emission of UV and  
 3 other wavelengths of light.  
 4 Do you see what I'm referring to there?  
 5 A. Yes, I do.  
 6 Q. The language in your report and the language in Dr.  
 7 Taylor's report is identical, even down to the punctuation?  
 8 A. Okay.  
 9 Q. Except Dr. Taylor says Manwaring '138 and you say  
 10 the '138 patent; correct?  
 11 A. Okay.  
 12 Q. Is that true?  
 13 A. Yes, it looks like it to me.  
 14 Q. Now, take a look, please, if you would, at Page 5,  
 15 running over to 6 of your report. This deals with Claim  
 16 54 of the '882 patent.  
 17 Do you have that, sir?  
 18 A. I do.  
 19 Q. And you will see there that in discussing Claim 54  
 20 of ArthroCare '882 patent you wrote, quote, The '138  
 21 patent discloses a evacuating fluid generated at the  
 22 target site using a suction lumen with a distal end  
 23 adjacent the electrode terminal, period. Column 7, Lines  
 24 26 to 31?  
 25 A. Yes.

1 Q. That's in your report; right?  
 2 A. Yes.  
 3 Q. Now, take a look at Dr. Taylor's report. And if you  
 4 could turn to Page 81...  
 5 And at the top of the page, there is a  
 6 discussion of Claim 54. Do you see that?  
 7 A. Yes, I do.  
 8 Q. And there is a reference there to the Manwaring  
 9 '138 patent. Do you see that as well?  
 10 A. I do.  
 11 Q. And in discussing Claim 54, Dr. Taylor's report  
 12 states, quote, Manwaring '138 discloses a evacuating fluid  
 13 generated at the target site, using a suction lumen with a  
 14 distal end adjacent the electrode terminal, period.  
 15 Column 7, Lines 26 to 31.  
 16 Do you see what I'm referring to?  
 17 A. Yes, I do.  
 18 Q. And that language is word for word, coma for coma,  
 19 the same words as what is your report except you say the  
 20 '138 patent and he says the Manwaring '138 patent; right?  
 21 A. Looks like that.  
 22 Q. Okay.  
 23 MR. BOBROW: Thank you, sir.  
 24  
 25

1  
 2 REDIRECT EXAMINATION  
 3 BY MR. MacFERRIN:  
 4 Q. Dr. Manwaring, I'll try to speak louder this time.  
 5 Do you have any education or training in  
 6 physics?  
 7 A. Yes.  
 8 Q. How about electrical engineering?  
 9 A. Yes.  
 10 Q. Did you take courses in college on those subjects?  
 11 A. Yes.  
 12 Q. In that college course on physics, did you cover  
 13 the experiment that you described that Newton had before  
 14 him?  
 15 A. Yes.  
 16 Q. Is that basic physics?  
 17 A. Yes.  
 18 Q. Do you use physics and electrical engineering  
 19 principles in your research?  
 20 A. Routinely.  
 21 Q. Now, when you signed your report, why didn't you  
 22 test for UV protons?  
 23 A. For the very simple reason that I hadn't been asked  
 24 to. I was given a charge to review and render an opinion  
 25 and I became very curious about whether there was

1 something unique about their instrument, and the more I  
 2 read into how the spark was being made and could see the  
 3 pictures of documents, I concluded that is identical to  
 4 how I do it, and so I have been provoked to look at that  
 5 further since our discussions.  
 6 Q. Well, before we --  
 7 MR. BOBROW: Your Honor?  
 8 BY MR. MacFERRIN:  
 9 Q. So was there no need or did you feel there was any  
 10 need for to you do any testing?  
 11 A. No, nothing was brought to my attention.  
 12 MR. MacFERRIN: Now, your Honor, I believe Dr.  
 13 Manwaring was asked about tests on cross-examination. I  
 14 believe that opened the door to the other matter that was  
 15 excluded.  
 16 THE COURT: No, it did not.  
 17 MR. MacFERRIN: Okay.  
 18 BY MR. MacFERRIN:  
 19 Q. Now, turning to the discussion of the Taylor report,  
 20 where he says that the spark results in UV protons, the  
 21 spark in your patent, does it surprise you that he agrees  
 22 with you?  
 23 A. Well, I would be surprised if he didn't. If someone  
 24 is skilled in the art of RF, I think if you looked at the  
 25 mechanism of how the energy was being passed through a

1 salt-laden water, I would be surprised if it isn't  
 2 identical among all these devices that are used in that  
 3 environment.  
 4 MR. MacFERRIN: Could I please have JTX-2?  
 5 BY MR. MacFERRIN:  
 6 Q. Could you please turn to JTX-2 in your binder, Dr.  
 7 Manwaring, in the last page?  
 8 MR. MacFERRIN: And could I have that up on  
 9 the screen?  
 10 BY MR. MacFERRIN:  
 11 Q. What does this show?  
 12 A. This document is a certificate of correction that  
 13 refers to Claim No. 1 of the Eggers patent. And being a  
 14 certificate of correction, it demonstrates that a change  
 15 has been made and approved in the language of the first  
 16 claim.  
 17 Q. I'd like to ask you, Dr. Manwaring, you were asked  
 18 about the rate of saline in your patent. Does this claim  
 19 say anything about the rate of saline delivery?  
 20 A. No.

21 ---  
 22  
 23  
 24  
 25

1  
 2 Q. Does the rate of saline delivery have anything to do  
 3 with the validity of this claim?  
 4 A. No, not whatsoever.  
 5 Q. If I could ask you to turn now to your patent,  
 6 DTX-46...  
 7 MR. MacFERRIN: If I can have that up on the  
 8 screen, please...  
 9 BY MR. MacFERRIN:  
 10 Q. I would like to ask you in particular to direct your  
 11 attention Column 7, Lines 26 to 31. I believe you were  
 12 asked about this on cross-examination. Do you see that  
 13 there?  
 14 A. Yes, I do.  
 15 Q. Now, the fluid that is, does it say the negative  
 16 pressure will drop fluid up into the tube?  
 17 A. Yes.  
 18 Q. Would that remove that fluid from the target site?  
 19 A. No. It's important to emphasize that the fluid  
 20 must always be present at the active electrode.  
 21 Q. Would there be some fluid that was removed from the  
 22 target site?  
 23 A. Yes. Fluid would always be there, and the evacuation,  
 24 whether it is sucking, essentially pulls fluid which is  
 25 salt laden, electrically conductive, by the electrode.

1 That's the principle.  
 2 Q. Do you consider that evacuation?  
 3 A. Yes.  
 4 Q. Now, the fluid that is evacuated, would that include  
 5 fluid that was generated at the target site?  
 6 A. It can.  
 7 Q. What kind of fluid would that include?  
 8 A. Well, heating in the presence of biologic tissue.  
 9 Let's say one is ablating, which means removing, tumor  
 10 tissue in the brain. That tissue is vaporized. And in  
 11 that vaporization is fluid in the form of gas, which  
 12 quickly mingles with the spinal fluid or the irrigated  
 13 normal saline. So it's a mix again.  
 14 Q. Could you now turn, please, to Column 6, Lines 50 to  
 15 63?  
 16 MR. MacFERRIN: Chris, if you could pull that  
 17 up for me, I would appreciate it.  
 18 BY MR. MacFERRIN:  
 19 Q. Now, are you referring to fulguration in this  
 20 passage?  
 21 A. That's correct. Maybe I could define fulguration,  
 22 because I know it's an unusual term.  
 23 Q. I would appreciate it if you would explain to the  
 24 jury what the sequence of events in fulguration is?  
 25 A. Yes. In surgery, when we use electrosurgery, we

1 can cut, we can coagulate or desiccate, or we can  
 2 fulgurate. That is essentially all we can do. When we  
 3 cut, we use one waveform and one voltage that incises  
 4 tissue and it has some heating effect, but it doesn't  
 5 really impart good sealing of blood vessels. So the blood  
 6 vessels can bleed, just like if you cut with a cold blade.  
 7 It's a little better than that.  
 8 When we contact desiccate, we have tied that  
 9 electrode right to the face of the tissue and it drives  
 10 current through the tissue. And as it goes by, it drives  
 11 the moisture out of the cells, and it seals blood vessels.  
 12 So we call it coagulation or desiccation, depending on  
 13 what technique we want.  
 14 On the other hand, fulguration, which is the  
 15 subject of my patent, is to have an electrode stand off  
 16 the surface of tissue and spark down to it. That sparking  
 17 is very high voltage, to get that effect. You can't do it  
 18 with low voltage or cutting. It has to be high. Typically  
 19 a thousand volts would be used. And that spark comes down  
 20 and hits the surface of the tissue and sears it, much like  
 21 the searing you are familiar with in cooking. And that  
 22 preserves the tissue beneath, keeps it viable, but stops  
 23 surface bleeding.  
 24 In this device, when we work in spinal fluid or  
 25 normal saline, fulguration refers to the sparking effect.

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1 You don't see sparking in contact desiccation. And with  
2 a magnifier, you might see it with cutting, but fulguration  
3 is truly what makes visible spark to your eye. And that  
4 sparking is passing across the steam barrier into the  
5 saline, or as you get closer to tissue. And that's what's  
6 having the therapeutic effect.

7 So it must have spark, it must have high  
8 voltage, it must have a gap and it must have non-contact.

9 Q. What happens first, the arc or the steam barrier?

10 A. The -- I will back up and explain this way.

11 Electricity passing through saline starts it to heat.

12 The heat turns into vapor. Now a spark can jump across.

13 Q. So, did you say you have vaporization before you  
14 have a spark?

15 A. That's correct.

16 Q. Do you continue to have vaporization after the spark?

17 A. Well, the vapor collapses into the tissue. As soon  
18 as the heat goes away, it's not sustained. Just like  
19 boiling on a pot. People are familiar with that. The  
20 bundle is a steam barrier.

21 Q. You were also asked about the fact that your device  
22 is monopolar?

23 A. Yes.

24 Q. Does that matter to the validity of these claims of  
25 the '882 patent?

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1 A. No, not in my judgment.

2 Q. Do you recall Mr. Eggers saying that that did not --  
3 that his claim included monopolar devices?

4 A. That's right.

5 Q. Does that confirm your opinion, the fact that your  
6 device is monopolar doesn't matter to the validity?

7 A. Yes, I know my device works in a bipolar mode, I  
8 know my device works in a monopolar mode. I think that  
9 is transparent to this issue of fulguration.

10 Q. You were also asked about your rate. Is that your  
11 usual rate?

12 A. No. In fact, most of the time, as you might imagine,  
13 I testify on issues of medical injury, like non-accidental  
14 trauma, shaken baby, very commonly neurosurgeons testify  
15 typically at about \$500 an hour if they were involved as  
16 expert witnesses.

17 Q. Why are you charging less than your usual rate?

18 A. Well, I have a particular interest. I am quite  
19 curious, because my patent has been cited as prior art.

20 MR. MACFERRIN: Thank you, Dr. Manwaring.

21 THE COURT: All right. Thank you very much,  
22 sir.

23 (Witness excused)

24 ---

25 MS. BOYD: Our next witness making his way

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1 into the courtroom now is Warren Heim. He was mentioned  
2 in Mr. Sparks' testimony. He is a mechanical engineer  
3 who specializes in medical devices. He was engaged by  
4 Smith & Nephew as a consultant in the development of the  
5 Control RF product. He is going to testify about that  
6 development, as well as some analysis that he did of the  
7 '882 patent early in that development process. The '882  
8 patent is the one we have also called the multiple-  
9 electrode patent.

10

11 ---  
12 ... WARREN P. HEIM, having been  
13 duly sworn as a witness, was examined  
14 and testified as follows ...

15 DIRECT EXAMINATION

16 BY MS. BOYD:

17 Q. Can you please introduce yourself to the jury and  
18 tell them a little about yourself?

19 A. Certainly. My name is Warren Heim. I live in  
20 Boulder, Colorado. I live there with my wife. We have  
21 been married for 23 years. We have four sons.

22 Q. That's quite a house you must have?

23 A. It is a busy one.

24 Q. What do you do for a living?

25 A. My wife and I own a small medical device research  
and development company. The name of the company is

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1 Team Medical. Team Medical develops new medical device  
2 technology based on our internal R&D efforts, patents  
3 the technology, and then licenses that technology to  
4 premium quality medical device companies.

5 Q. Does Team Medical actually sell medical devices?

6 A. Team Medical does not manufacture nor sell products  
7 of its own. We are an R&D company. We have laboratories  
8 and analytical skills that we use to develop our  
9 technology that we then patent.

10 Q. Can you describe for the jury your educational  
11 background, starting with college, please?

12 A. I attended Dartmouth College. Dartmouth is in  
13 Hanover, New Hampshire. I was at Dartmouth for six years  
14 and I received three degrees from the institution. In  
15 1973, I graduated with an AB, that is a Bachelor's of  
16 Arts degree, it was a liberal arts degree. I then went a  
17 fifth year, and graduated with a Bachelor of Engineering  
18 degree. I then was there another year, and graduated with  
19 a Master's of Engineering degree. The specialty was  
20 mechanical engineering.

21 Q. Can you describe what work you did immediately  
22 after graduating with your Master's degree in engineering?

23 A. When I graduated in 1975, I initially worked in the  
24 energy and environmental field. In particular, I worked  
25 on various projects associated with converting coal and